

Typology of Students at Risk of Dropping out of School:
Description by Personal, Family and School Factors

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Abstract

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Description by personal, family and school factors

The purpose of this study was to identify the different subgroups of students at risk of dropping out of school. The typology was developed based on the three main contexts associated with school dropout risk, namely, the personal, family and school contexts. On the basis of these factors, the clustering results enabled us to categorize at-risk students into four subgroups: (1) the Covert behavior type, (2) the Uninterested in school type, (3) the School and Social Adjustment Difficulties type, and (4) the Depressive type. Moreover, considering all the contexts involved in school dropout, the clustering technique confirms the importance of behavior problems and learning difficulties, while emphasizing the significance of both depression and the family and classroom environments in the development of dropout risk. Students at risk of dropping out of school report many family organisational problems and that they obtain little emotional support from their parents. They also perceive little order or organisation in the classroom.

Keywords: typology, school dropout, early adolescence

Résumé

Typologie des élèves à risque de décrochage scolaire :

Description à partir des facteurs personnels, familiaux et scolaires.

Le but de cette étude est d'identifier les différents sous-groupes d'élèves à risque de décrochage scolaire. La typologie développée se base sur les trois principaux contextes associés au risque de décrochage scolaire : le contexte personnel, familial et scolaire. Les analyses nous permettent de classer les élèves à risque de décrochage scolaire selon quatre sous-groupes : (1) le type comportements antisociaux cachés, (2) le type peu intéressé par l'école, (3) le type présentant des difficultés d'adaptation sociales et scolaires et (4) le type dépressif. En considérant tous les contextes impliqués dans le risque de décrochage scolaire, la typologie souligne non seulement l'importance des troubles du comportement et des difficultés d'apprentissage dans le risque de décrochage scolaire mais identifie aussi la contribution importante d'une part de la dépression des élèves et, d'autre part, du contexte familial et scolaire. En effet, ces élèves rapportent qu'ils ont peu de support émotif de leurs parents et qu'ils vivent plusieurs problèmes d'organisation familiale. Enfin, ils perçoivent peu d'ordre et d'organisation dans la classe.

Mots clés : typologie, décrochage scolaire, adolescence

High school dropout is a major social problem in Quebec. Data from the Ministry of Education of Quebec (MEQ, 2004) showed that in 2002-2003, 28% of young people left school without having obtained a high school diploma. It has become very important for educational professionals to better understand why so many youths fail to complete their high school studies as the consequences of school dropout are very significant for the young person involved, personally, socially and economically. In personal terms, many dropouts have shown social maladjustments, such as behavior disorders and delinquency (Fortin & Picard, 1999; Jimerson, Anderson & Whipple, 2002). Socially, they have been characterized by a higher rate of unemployment and greater reliance on social assistance and employment insurance than graduates (Garnier, Stein & Jacobs, 1997). Economically, their lack of technical training has made it difficult for them to enter the labor market. Many authors believe that prevention measures must be applied as early as possible, while the students are still in school, because it is much easier to keep them in school than to induce them to come back (Franklin & Streeter, 1995; Rumberger, 1995). Some studies have shown that students at risk for dropping out do not all exhibit the same psychological, family or school profiles (Aloise-Young & Chavez, 2002; Janosz, Le Blanc, Boulerice & Tremblay, 2000; Kronick & Hargis, 1990). We believe that a more comprehensive understanding of the different subgroups of at-risk students would allow the application of prevention programs adapted to the needs of each subgroup, so as to modify their developmental pathway and promote their academic and social adjustment. The main objective of this study was to verify, at the beginning of high school, the existence and the characteristics of different subgroups among students at risk for dropping out.

Personal characteristics of students at risk for dropout

Students at risk for school dropout were those who are attending school, but show a very high probability of leaving school without obtaining a diploma. The Ministry of Education of

Quebec (MEQ, 2000) defines a school dropout as someone who leaves school without obtaining a high school diploma and does not re-enroll the following year. Over the past few years, researchers have identified certain cognitive, emotional and behavioral characteristics allowing the identification of students at risk of dropping out. From the cognitive viewpoint, learning difficulties have constituted a particularly important variable and the one most frequently reported in studies on this subject (Battin-Pearson, Newcomb, Abbot, Hill, Catalano & Hawkins, 2000; Garnier et al., 1997; Worrell, 1997). Also reported were other factors associated with academic performance, such as grade retention and low academic achievement (Jimerson, Anderson & Whipple 2002). In emotional terms, at-risk students lack of motivation and interest in school (Vallerand, Fortier & Guay, 1997). They do not value academic success or adhere to the values represented by the school (Alexander, Entwisle & Horsey, 1997). They also often exhibit various other difficulties, such as social withdrawal, high anxiety levels and important depression problems (Marcotte, Fortin, Royer, Potvin & Leclerc, 2001). Many of these students do not meet the expectations of school personnel. Jimerson, Egeland, Sroufe and Carlson (2000) found that a high frequency of behavior problems is one of the strongest predictors of school dropout. Some of these students engage in aggressive behavior (Royer, Desbiens, Bitadeau, Maltais & Gagnon, 1999), delinquency (Fortin & Picard, 1999) or drug or alcohol abuse (Younge, Oetting & Deffenbacher, 1996). Inappropriate behavior is frequently reported as a consequence of their lack of social skills (Fortin & Picard, 1999). Their inappropriate behavior also results in many detentions, truancy and expulsion from school (Alexander et al., 1997; Walker, Grantham-McGregor, Himes, Williams & Duff, 1998).

Family factors associated with dropout risk

In their study of 205 families, Garnier et al. (1997) found that the events leading to school dropout began in the family. For example, the marginal values of parents who chose to lead non-

conventional lifestyles, such as having drugs in the home, are strongly associated with school dropout for the child. In terms of family structure, at-risk students often come from broken homes or single-parent families (Pong & Ju, 2000; Walker et al., 1998). Looking at the parent-child relationship, Potvin, Deslandes, Beaulieu, Marcotte, Fortin, Royer & Leclerc (1999) found that parents' poor parenting practices, including lack of emotional support, lack of involvement in the child's school activities and inadequate supervision, were strongly associated with school dropout risk. Conflicts between at-risk adolescents and parents, or among family members, are frequently reported by other authors (Gillock & Reyes, 1999; Walker et al., 1998). Moreover, the parents do not always adequately supervise their children's activities (McNeal, 1999). Battin-Pearson et al.(2000) and Rumberger (1995) reported that low parental expectations regarding school achievement was a variable strongly associated with the child's dropout. Generally, studies found a significant link between the level of parental participation in school-related activities and the child's academic performance (Finn & Rock, 1997; McNeal, 1999). Lastly, Orthner and Randolph (1999) found that students at risk for dropping out often came from families living on social welfare or where parents were experiencing frequent job changes, whereas the dropout risk was considerably lower for children from families in which the parents had stable employment.

To summarize, low parental expectations towards school achievement and inadequate supervision of day-to-day activities are variables strongly associated with the child's dropping out of school. Moreover, Jimerson et al. (2000) found that the quality of the family environment and the quality of parenting given to the child are strong predictors of school achievement or dropout.

School factors associated with dropout risk

Students spend a great deal of time at school and the school context plays a very important role in the personal and social development of adolescents. We may wonder why school achievement and dropout rates vary from one school to another. Although this question has been much less investigated than that of the individual characteristics of at-risk students, certain factors associated with classroom organization, the teacher-student relationship and the school climate are particularly enlightening. Pierce (1994) found that the classroom climate and the interactions between teacher and student had an effect both on academic achievement and the student's engagement in school and social activities. In a study of 1,123 high school students, Bennacer (2000) reported that the teacher could foster academic achievement by improving the psychosocial conditions in the classroom. For example, classroom organization and task orientation stimulated better academic performance. On the other hand, excessive focus on rules was associated with lower academic performance. A classroom environment in which the rules were unclear and inconsistently applied also increased the dropout risk (Fortin, Royer, Potvin, Marcotte & Yergeau, 2004). In addition, these researchers found that a teacher focused on punitive interventions and frequent suspensions contributed to increasing the student's dropout risk.

According to several studies, students frequently cite negative school experiences as an explanation for dropping out (Franklin & Streeter, 1995; Reyes & Jason, 1991). Vallerand and Senecal (1991) found that dropouts perceived their teachers as being controlling, unsupportive and uninterested in them. Potvin and Paradis (2000) found that the quality of the teacher-student relationship, in terms of attitudes and the behavior that may result, had an impact on the student's performance and persistence in school. Lastly, Kasen, Johnson and Cohen (1990) suggested that the school climate had a strong influence on the student, as it may contribute indirectly to increasing attention deficits, oppositional disorders and other behavioral disorders.

Heterogeneity of the dropout population

We know that students react to risk factors in different ways, and the great variety of risk factors reported in the literature suggests that at-risk students may form a heterogeneous group. This was confirmed by several studies on dropout typologies conducted by Kronick and Hargis (1990) and more recently, Janosz et al. (2000). Kronick and Hargis (1990) identified three types of dropouts based on students' individual characteristics, school experiences and period of disengagement. The first subgroup consisted of students with learning and behavioral difficulties (Low-Achiever Pushout). The students in this group left school because of frustrations resulting from academic failure. The second subgroup was composed of quiet students (Quiet Dropout). These students exhibited learning difficulties but no behavior problems. The third and last subgroup was entitled the In-School Dropout. These students wrote their final exams, but failed, left school and did not return. In the typology proposed by Kronick and Hargis (1990), only two factors associated with school dropout were used to categorize the students: academic difficulties and behavior problems. However, the research showed that a variety of personal, family and school factors were strongly associated with school dropout, which suggests that this typology did not encompass all students placed at risk.

In their work, Janosz et al. (2000) identified four types of dropouts. The first subgroup resembled the Quiet Dropout type described earlier. While in school, these students exhibited no behavior problems and were engaged in school, but their academic performance was somewhat lower than that of graduates. The second subgroup was composed of Disengaged Dropouts. These students had few behavior problems, were involved in school activities and performed academically within the average. The third subgroup was labeled the Low-Achiever Dropout. Students of this type showed little involvement in school, had few behavior problems and performed very poorly academically. The fourth and last subgroup was entitled the Maladjusted

Dropout. These students exhibited many behavior problems, as well as poor academic performance. The students studied by Janosz et al. (2000) came from cohorts assessed between 1974 and 1985, which means that the participants are now adults. There is no evidence to suggest that the characteristics displayed at the time by these cohorts are comparable to those of a cohort composed of younger students in the year 2000. Although Janosz et al. (2000) reported taking into account both family and environmental factors, these variables were not reported in the subgroup categorization. Lastly, we noted that the two above typologies identified two similar subgroups: specifically, the Quiet Dropout and Maladjusted Dropout types identified by Janosz et al. (2000) were comparable to types described by Kronick and Hargis (1990).

In summary, we have found that most of the reported studies tend to consider one single context of the student's environment, whereas overall, the literature reviewed has suggested that different influences contribute to the development of the school dropout risk. Consequently, multifactorial studies are more likely to contribute to the advancement of knowledge, as they can take simultaneous account of the contexts most strongly associated with persistence in school. For example, Fortin et al. (2004) showed that seven factors were the best predictors of a student's dropout status: depression effects, low family cohesion and organisation, low student involvement, negative teachers' attitudes, low performance in mathematics and French. Furthermore, we have noted that the risk factors often affected students in different ways, which suggests that at-risk students show different profiles of difficulties and therefore form a heterogeneous group. Consequently, a prevention program focused on behavior problems or learning disabilities would not meet the needs of all students placed at risk because the program's effectiveness would depend on its ability to target the specific needs of the young people concerned. Moreover, the two typologies mentioned earlier showed the existence of different types of dropouts. As we stated, these two typologies identified subgroups based on the students'

personal characteristics in the school context at the end of adolescence, after they have left school. In these two studies, important personal factors such as depression, certain family factors such as the lack of family cohesion, and certain school factors such as the lack of order and organization in the classroom, were not used to identify the subgroups. Consequently, it is very probable that certain types of at-risk students were excluded from these typologies. The typologies were not compared to a group of students without risk of dropout, and therefore it was not possible to show how they differed from a normal population. Moreover, the study by Janosz et al. (2000) was designed to examine delinquency, which may have influenced the characteristics used in determining the typology. Lastly, there is no indication that the characteristics of the subgroups of dropouts examined by Janosz et al. (2000) in the 1970s corresponds to those of today's 12 to 13 year old students at risk for dropout, an age when the developmental pathways of at-risk students can still be altered.

Recognition of the individual differences and specific needs of subgroups of students is essential because this makes it possible to plan differentiated prevention programs corresponding to the characteristics of each type of at-risk student. Our study used a multifactorial framework evaluating a large number of personal, family and school variables and aimed, as its first objective, to identify the subgroups of students at risk for dropout at the beginning of high school. The second objective of the study was to compare the different subgroups of at-risk students to students who are not at risk of dropping out. The third objective was to test the validity of our typology.

Method

Participants

The convenience sample consisted of 810 Grade 7 students from three cohorts attending four high schools in three Quebec regions: Quebec City (184 students), Trois-Rivières (389

students) and Sherbrooke (237 students). The French-Canadian participants were 12–13 years old; 54% were boys and 46% were girls. The selection of the at-risk and not-at-risk groups was made through the use of the Decisions screening test (Quirouette, 1988). The sample was divided into two groups, consisting of 317 students at risk of dropping out (39% of the sample) and 493 who were not at risk (61% of the sample). The at-risk group included 235 students that scored above the at-risk threshold on one or more of the six scales of the Decisions screening test. On this same test, the other 82 at-risk students scored above the mean on the highly positively skewed total score, although their scores on each of the six scales were not within the at-risk range. We noted that there were no significant differences between boys and girls regarding prevalence of dropout risk as measured by the Decisions test scores: the distribution of risk was comparable between boys and girls. We therefore did not consider gender in our cluster analyses. The percentage of dropout risk for boys and girls did not seem to converge with the percentage of dropout. Similar results were obtained for high school students by Everett (1997) and Ripple and Luther (2000). In terms of the Ministry of Education of Quebec (2000) socio-economic indicators, the Sherbrooke and Quebec City cohorts are located in more disadvantaged socio-economic areas, whereas the Trois-Rivières cohorts come from middle-class areas. Two variables were used in order to establish the socio-economic index: the proportion of mothers without a diploma was weighted two thirds of the index, and the proportion of families in which neither parent works full time was weighted one third of the index (Ministry of Education of Quebec, 2000).

The participants came from the first year of an extensive longitudinal correlational nine year repeated-measures study focusing on adolescents' school achievement and social adaptation. In this large-scale research project, the independent variables were characteristics associated with the family, the school and the students, while the dependent variable was the risk score obtained

on the Decisions test (Quirouette, 1988). However, the present study has used the clustering technique based on analysis of interdependence among the different factors associated with dropout risk. Thus, in this context, identification of independent or dependent variables was not relevant.

Measures

Decision (Quirouette, 1988). This questionnaire was used to identify students at risk of school dropout. This self report questionnaire consists of 39 questions covering six risk dimensions: (a) family environment, (b) personal characteristics, (c) school plans, (d) academic abilities, (e) student-teacher relationship and (f) school motivation. Quirouette (1988) has conducted several studies on the instrument's psychometric properties. For reliability, a test/retest procedure gave a correlation of .90 at time 1, .92 at time 2 and .93 at time 3. When considering the instrument's internal consistency, the Cronbach's alpha coefficient varied from .85 to .90 for the set of six scales. For our study, Cronbach's alpha on the entire questionnaire was .89 at time 1, .88 at time 2 and .86 at time 3. The questionnaire's predictive validity was assessed based on its capability to predict actual school dropout for two high school student cohorts. The percentage of correctly classified cases was 88% for one cohort of 1,034 students followed for four years, and 92% for another cohort of 305 students also followed for four years. Each scale had a critical threshold, established by the author following various statistical analyses, and above which the score represented a significant difficulty. Students were classified at-risk when their score on one or more of the instrument's six scales exceeded the critical threshold.

Analysis of school records. Using the data contained in the school records, student profiles were drawn up based on such variables as French and Math grades and truancy.

Social Skills Rating System (Gresham & Elliot, 1990). This questionnaire provided a multivariate assessment of the social behaviors of students in school. The teacher's version

consists of 51 statements divided into three subscales: social skills (cooperation, assertion, self control), problem behaviors (externalizing problems and internalizing problems) and academic competence. The S.S.R.S. shows adequate reliability (test-retest: .90; Cronbach's alpha: .90) and concurrent validity with the following test scales: Social Behavior Assessment (Stephens, 1978 in Gresham & Elliot, 1990), The Harter Teacher Rating Scale (Harter, 1978 in Gresham & Elliot, 1990) and the Child Behavior Checklist (Achenbach, 1982 in Gresham & Elliot, 1990). Principal-axes factor analyses with Varimax rotation conducted with 810 high school students indicated that the Quebec version had the same factorial structure as the American version. The internal consistency coefficients ranged from .79 to .92.

Beck Depression Inventory (BDI) (Beck, 1978). This self-report measure consists of 21 items assessing the intensity of emotional, behavioral, cognitive and somatic symptoms characteristic of depression. Each item offers a choice of four answers graduated from 0 to 3. The psychometric qualities of the BDI have been confirmed for Quebec adolescents, with internal consistency coefficients ranging from 0.86 to 0.88 (Baron & Laplante, 1984 ; Gosselin & Marcotte, 1997). A cut-off score of 16 has been suggested to identify subjects manifesting characteristics of clinical depression (Strober, Green & Carlson, 1981).

Self-Reported Delinquency Questionnaire (LeBlanc, 1994). This instrument provided a self-reported measure of the adolescent's violent and antisocial behavior. It comprises 29 questions on different delinquent activities (vandalism, petty theft, more serious theft, assault, drug use, alcohol use and other behaviors). Response choices on a 4-point Likert scale enables the adolescent to specify the frequency of his/her delinquent behavior. This questionnaire was previously validated with 6,604 participants aged from 10 to 18.

Parental style. (Steinberg, Lamborn, Dornbusch & Darling, 1992 in Deslandes, Bertrand, Royer & Turcotte, 1995). This self-report instrument assessed three dimensions of the parenting

style using the following three subscales: (a) parental involvement (9 items), (b) parental supervision (8 items), and (c) encouragement of autonomy (9 items). The internal consistency indices of these Likert scales are adequate and the construct and content validity have been demonstrated in Quebec studies of adolescents (Deslandes et al. 1995).

Family Environment Scale. (Moos & Moos, 1981). This self-report questionnaire of 45 statements measures the social and environmental characteristics of the family. Each statement is answered true or false. Five subscales assess the following dimensions: (a) cohesion, (b) expression, (c) conflicts, (d) organization, and (e) control. The reliability of this questionnaire has proven adequate (alphas varying between 0.68 and 0.78) and concurrent validation has been demonstrated with several tests.

Parental participation in school follow-up. (Epstein, Connors and Salinas, 1993 in Deslandes et al., 1995). This self-report questionnaire consists of 20 statements presented in five subscales: parental emotional support; communication with teachers; parent-adolescent interactions pertaining to school; parent-school communication and parent-adolescent communication.

Classroom Environment Scale. (Moos & Trickett, 1987). This self-report questionnaire assessed the classroom social climate. The condensed version includes nine scales of five statements each (a total of 45 statements), with a choice of true or false answers. The scales are: engagement, affiliation, teacher support, task orientation, competition, order and organization, clarity of rules, teacher control and innovation. The questionnaire has been shown to have adequate reliability (Cronbach's alpha between 0.52 and 0.75) and concurrent validity with other instruments (between 0.16 and 0.40).

Teacher's attitudes towards the student scale (Potvin & Rousseau, 1991). This questionnaire is answered by the teacher, assessing the teachers' attitudes towards the student. It

consists of 18 bipolar adjectives; each pair of adjectives has a value of -3 to $+3$, providing a minimum total score of -54 and a maximum total of $+54$. The instrument's reliability is adequate (Cronbach's alpha between 0.50 and 0.86).

Procedure

In September, all Grade 7 students at each of the selected schools were invited to participate in the study. The only students to be excluded were those exhibiting intellectual disabilities, as these students very rarely obtain a high school diploma. All participants were contacted through the teachers. The percentage of students who accepted to participate was 78,1% and there were no attritions. Each teacher was informed about the purpose of the study by the principal, and was subsequently met by one of the researchers, who explained the main research objectives and invited the teacher to participate. The parents or legal guardians were also contacted and asked for consent; they were given a guarantee that all collected information would remain confidential. The English questionnaires were translated into French and were then administered in class to the participants, always in the same order. Two research assistants, trained in administering the tests, were assigned to each school. While the students answered their questionnaires, the teacher completed the teacher questionnaires for each participating student in his/her class. The data collection took place in October and March at the three sites.

Results

Data analysis strategy

A cluster analysis of the at risk of dropout students was performed based on the six-stage procedure proposed by Hair, Anderson, Tatham and Black (1998) after subgroup identification with clustering variables. Discriminant analysis and one-way analysis of variance on the clustering variables and validation variables were used to complete the interpretation and the

validation of the clusters found. The process of interpretation and validation also included comparisons with not-at-risk students using Dunnett's multiple comparisons procedure.

The objectives of the clustering were to identify relatively few subgroups of at-risk students based on the variables related to behavior problems, academic results, level of family functioning, level of emotional support from parents and the classroom climate. Variables on each dimension were used as clustering variables while others were kept as validation variables.

Preliminary analysis

Inspection for outliers gave negative results on each clustering variable (no absolute z scores were greater than 3) and, subsequently, the dendrogram confirmed that no outliers emerged during the clustering process (no clusters with less than 10 students). As proposed by Hair et al. (1998), the similarity measure was chosen at this stage and the squared Euclidean distance was preferred. A few subjects had missing data on one or two variables. The worst variable with missing data was the Family Cohesion measure, for which 10 subjects had missing data. They were replaced by a normal random substitution with the same mean and standard deviation for that variable. This procedure was simple and could not have artificially inflated the similarity of these subjects.

The correlation matrix of the clustering variables was also inspected for high correlations. The highest correlation was -0.66 between the Externalizing Problems score and the score obtained on the Teacher's Attitudes scale. The two variables were finally kept for the analysis because of their theoretical and empirical importance. However, for all other questionnaires with subscales, total scores were not introduced together with subscale scores of that questionnaire in order to minimize multicollinearity problems. The student's grades in Mathematics were kept as a clustering variable, while the French grades were discarded (due to a 0.64 correlation with the

Mathematics score) but retained for the validation stage. The same situation arose for the Emotional Support score, which was used for the analysis, while the Communication with Parents score was retained for the subsequent validation purposes ($r = 0.61$).

Subgroups identification of students at risk of school drop out

The clustering was performed with the original unstandardized scores using Ward's method as the hierarchical clustering algorithm. An initial analysis gave interesting results with a sufficient number of subjects in each cluster. However, as suggested by Hair et al. (1998), the analysis was run again after removing two variables as the clusters did not significantly differ on them. These variables were two subscales of the Classroom Environment Scale (Affiliation with Others and Clarity of Classroom Rules). Table 1 shows the scree test performed on an extract of the agglomeration coefficients (distance measures) showing results for the first eight cluster solutions. This was the only information provided by SPSS to specify the number of clusters. The four cluster solution was studied further since a larger percent increase in distance measures was obtained compared to the three cluster solution. As stated earlier, close inspection of the dendrogram showed no outliers. The smallest cluster consisted of 34 subjects (cluster 4).

Insert Table 1 about here

Interpretation of the clusters could be performed using the descriptive statistics of the 11 clustering variables and the risk of dropping out score given in Table 2, for each of the four clusters of at-risk students and the control group. The control group was not included in the clustering analysis, but provided helpful information facilitating the interpretation of the clusters' profiles. The clusters that were significantly different from the control group (Dunnett's technique) are also reported in the last column. The order of the clustering variables was based on the coefficients of the structure matrix (correlations between each variable and each function) obtained with the discriminant analysis performed among the four clusters and reported in Table

3, describing the structure matrix of the discriminant analysis between the four clusters followed by the cluster centroids on the three significant functions.

Insert Table 2 here

As it appears in Table 3, the most significant variables of the first function are the Teacher's attitude toward the student (0.95), the Externalizing problems scale (-0.35) and Math grades (0.27). Cluster centroids clearly demonstrated that cluster number 3 (called SSAD for School and Social Adjustment Difficulties) was located on the far left side of the function (-2.48) as opposed to the other three clusters. Variable means reported in Table 2 indicate that the teachers of the cluster 3 students had negative attitudes toward them (-4.8) and that these students had more externalizing behavior problems (3.85) and lower performance in Mathematics (62) compared to the other three clusters. The only means that differed significantly from those of the control group on the Teacher Attitude (35.2) and on the Externalizing Problems (0.91) were those of students in cluster 3. These students also had lower results in Mathematics than students who were not at risk (80).

Insert Table 3 here

The second function shown in Table 3 emphasizes the role of family variables, particularly family cohesion. The fourth cluster had the lowest centroids on this second function (-2.94). Means appearing in table 2 indicate that students in the fourth cluster (identified as DEP for Depressive) had significantly lower scores on the Family Cohesion (15.9), Family Expression (39.2) and Family Organization (44.5) scales, and had higher scores on the Beck Depression Inventory (18.3). Like clusters 1 and 3, cluster 4 had significantly lower means on the family scales than the control group and all four clusters reported higher depression scores than the control group. But the fourth cluster is the one with more extreme scores on these scales.

The third function presented in Table 3 identifies the Family control scale as the most important variable on that specific function (0.89) and shows that cluster 1 had a lower centroid on this third significant function. The mean of the Family control scale reported in Table 2 was lower (44.2) for this cluster (called ACB for Antisocial Covert Behavior). This first cluster also had a significantly lower score than the control group, while the fourth cluster reported a higher score. We must note that cluster 1, like the other clusters, had means significantly different from those of the control group on a majority of clustering variables.

Finally, centroids reported in Table 3 were more positive on the first two functions. The descriptive statistics in Table 2 suggest that students in cluster 2 had fewer problems than the others (this cluster was then called US for Uninterested in School). This was actually the case, as suggested by the mean risk score on the last line of Table 2, which is lower (6.4) than those of the other clusters but significantly higher than the control group mean score (2.1). Table 2 also shows that cluster 2 had lower scores than the control group in Mathematics (.73), Parents' Emotional Support (2.9) and Classroom Organization (1.8), while having higher scores on the Depression (.9) and Delinquency scales (4.4). But cluster 2 also shows the least significant differences with the control group.

Typology based on personal, family and school contexts

Based on the discriminant analysis of the four clusters, the final typology was developed with the three main contexts associated with school dropout risk, that is, the personal, family and school contexts. The personal context included poor academic performance, inappropriate behavior, lack of social skills and the presence of depression. The family context related to the quality of the family climate measuring the social and environmental characteristics of the family. The school context included teachers' attitudes and the classroom social climate. On the basis of these factors, the clustering results enabled us to categorize at-risk students into four

subgroups: (a) the Antisocial Covert Behavior (ACB) type, (b) the Uninterested in School (US) type, (c) the School and Social Adjustment Difficulties (SSAD) type, and (d) the Depressive (DEP) type. In the following section, we describe in detail each subgroup's characteristics.

Cluster 1: The Antisocial Covert Behavior Type. This subgroup consisted of 60 students, representing 18.9% of the at-risk sample. These students' academic performance was good, although slightly below average. Teachers' attitudes were very positive and they described these students as not exhibiting any behavior problems. However, a more detailed analysis of the self-reported questionnaires (not reported in Tables 2 and 3) revealed that the students had antisocial covert behavior problems. The term Antisocial Covert behavior was used by Loeber, Wung, Keenan, Giroux, Stouthamer-Loeber, Van Kammen, & Maughan, B. (1993) in defining a type of juvenile behavioral disorder and we think it is appropriate to describe these students. The most frequently reported behaviors included lying, individual and gang fighting, petty theft, vandalism and breaking and entering. They also exhibited a high level of depression (15.5), reporting feelings of sadness, discouragement and frequent failure. On family measures, this subgroup differed significantly from the control group, showing lower scores on cohesion (40.4), expression (50.1), organization (48.2), emotional support (2.6) and parental control (44.2). The students in this subgroup reported that family rules and routines were chaotic or non-existent. Compared to the control group, they perceived little order and organization in the classroom (1.8). It is important to note that this subgroup did not correspond to any of the types described by Janosz et al. (2000) or Kronick and Hargis (1990).

Cluster 2: The Uninterested in School Type. This subgroup was composed of 126 students, representing 39.7% of the at-risk sample. Emotionally, they showed depression levels slightly higher than those of the control group. Their academic performance in mathematics was very good, but they lacked motivation in class and were generally bored in school (detailed results not

reported here). Teachers' attitudes toward these students were very positive (37.3) and the teachers described them as having no behavior problems (.98). Moreover, the students appeared to have a very good repertoire of social skills. These students perceived their family functioning as good, but they perceived their parents as giving them little emotional support (2.9). In class, they perceived little order and organization (1.8). This type of at-risk student was the one which most closely resembled the control group and thus demonstrated the lowest dropout risk (6.4). This group was similar to the Quiet Dropout category described by Janosz et al. (2000) and Kronick and Hargis (1990).

Cluster 3: The School and Social Adjustment Difficulties Type. This subgroup was composed of 97 students, representing 30.5% of the at-risk sample. Of the four subgroups, these students had the lowest score in mathematics (62) and the highest levels of behavior problems (3.85) and delinquency (6.8). They also showed rather high levels of depression (12.4). In school, teachers showed very negative attitudes towards these students (-4.8). Similarly to the previous subgroups, these students perceived little order and organization in the classroom (1.5). As for family factors, this subgroup resembled the Antisocial Covert Behavior subgroup on the expression (50.1), organization (50.2) and emotional support subscales (2.6); however, these students reported more family cohesion (46.7) and control (50.2). This subgroup corresponded to the Maladjusted Dropout described by Janosz et al. (2000) and the Low-Achiever Pushout identified by Kronick and Hargis (1990).

Cluster 4: The Depressive Type. This subgroup was composed of 34 students representing 10.7% of the at-risk sample. These students achieved average grades and showed the lowest incidence of externalizing behavior problems. Teachers appeared to have very positive attitudes towards them (38.5). These students were characterized mainly by very high levels of depression (18.3), exceeding the clinical threshold (16) suggested for Beck's questionnaire. They reported

feeling sad and discouraged, making more mistakes than others, crying continually and thinking about suicide. With regards to the family, this subgroup perceived the greatest problems, reporting the lowest levels of family cohesion (15.9), expression (39.2), emotional support from parents (2.2) family organization (44.5), and experienced the greatest amount of parental control of all subgroups (57.2). In class, these students perceived very little order and very little organization (1.4). We noted that this subgroup did not correspond to any of the types identified by Janosz et al. (2000) or Kronick and Hargis (1990).

Typology validation

Validation of the clusters was performed at the last stage of the clustering technique (Hair et al., 1998). An initial way to provide validation was by comparing the clusters on other variables theoretically associated with the seven clustering variables but not included in the former cluster analysis. Table 4 reports the descriptive statistics of the validation variables for the four clusters and the control group as well as Dunnett's post hoc test. As can be seen, Cluster 3 (SSAD type) also had the worst results in French grades (64.4), more Internalizing Problems (4.33) and a lower score on the Cooperation scale (10.8). These results were consistent with the problems found earlier for that type. Of the four subgroups, students belonging to the DEP type showed the highest Family Conflict score (62.3), which was also consistent with the previous findings related to greater problems in this subgroup's family functioning. The cluster 1 (ACB), like cluster 3 (SAAD), had higher internalising problems (4.07) and, like the other two clusters, showed significant differences on a majority of variables when compared to the control group. Finally, cluster 2 was again the cluster with the least significant differences with the control group. These students obtained lower French grades (71.0) and perceived lower parental involvement (3.51) but greater teacher control (2.43) than control students.

Insert table 4 here

The other approach to validation was by switching the clustering technique. The first alternate validation method used was a non-hierarchical method, where the seed points were the means of the previous clusters on the clustering variables. Table 5 shows that this other approach to validation provided results almost identical to those of the hierarchical method: cluster 1-A in table 5 was almost equal to cluster 1 in table 2 and so on. Table 6 also reports the findings obtained with a non-hierarchical method, but with random seed points. This method yielded clusters (1-B to 4-B), which were apparently different from clusters 1 to 4 (see Table 2). However, the method gave only more polarized clusters and validated the role of variables such as Teacher Attitudes, Externalizing Problems, Depression and all the family related scores. In fact, clusters 1-B and 3-B, as opposed to clusters 2-B and 4B, demonstrated that Teacher Attitude and Externalized Problems gave extremely different clusters. But clusters 1-B and 3-B, that were similar to previous cluster 1 (CB) and 3 (SSAD) in Table 2, were now different on family variables, especially Family cohesion. Clusters 1-B and 4-B were also opposed to clusters 2-B and 3-B on all the Family scores. This method validated the findings based on the discriminating role of the preceding variables, but the real descriptions of the four clusters should be based on the profiles presented in Table 2 and the *typology* section.

Insert Table 5 and 6

Discussion

The results show that students at risk for school dropout encounter many more social and school adjustment difficulties than not-at-risk students, and the nature of these difficulties varies in accordance with different contexts, namely the personal, family and school contexts. On the personal level, compared to not-at-risk students, the four subgroups obtain a higher score for depression. In terms of the family context, they show significantly lower scores on the parental emotional support and family organization variables. Finally, in terms of school factors, they

perceive the classroom as having little order and little organization. However, despite these similarities, the clustering technique results show that students at risk of school dropout form a heterogeneous group. The studies conducted by Janosz et al. (2000) and Kronick and Hargis (1990) confirmed the heterogeneity of dropouts with respect to certain individual characteristics of the students. This study goes further in this regard, as our results show that students at risk for dropout are different from each other not only in individual, but also in family and school characteristics.

School dropout risk typology: four specific profiles on family problems and school dropout risk

The Uninterested in School subgroup attracts attention because, in addition to being the most numerous subgroup, it is the one which most closely resembles the control group. As shown by the results, this subgroup exhibits the fewest personal, family and school problems. These students display a good academic performance and very good social adjustment. They perceive their family as adequate, although they report that their parents give them little emotional support. Thus, they report receiving little help in their homework and little encouragement for school or social activities, and rarely discuss their courses with their parents. However, these students mention that school achievement is valued by their parents. Potvin et al. (1999) believe that a lack of parental emotional support is a factor strongly associated with the child's risk of dropping out. But the results we obtained suggest that the school context is the main factor involved. The students in this subgroup perceive little order and little organization in class. They find that other students are agitated and unruly and waste a great deal of time. The problems shown by this subgroup relate mainly to school motivation and a lack of interest in school; however, they establish good relationships with their teachers. In keeping with this finding, Bennacer (2000) shows that school achievement is associated with classroom organization and a strong focus on the task. Further, Janosz and LeBlanc (1996) report that the dropout risk

increases when a school is unable to provide a clear, consistent and well-structured framework.

To summarize the findings for this subgroup, these students' personal, family and school contexts show the presence of many skills and resources. Moreover, their accumulation of risk factors is not very high. Therefore, we believe that the students in this subgroup should be priority targets for intervention; given their resources, the probability that they would respond successfully to a prevention program focusing on their interests is very high.

The Antisocial Covert Behavior subgroup also appears to meet many of the school's requirements. These students show satisfactory academic performance and teachers' attitudes toward them are positive. The teachers describe them as pleasant, hardworking, sociable, cooperative and obedient. However, these students engage in a number of offences and inappropriate behavior which seem to escape the teachers' observation, as the teachers report an absence of behavior problems. This subgroup's school functioning resembles that of the Uninterested in School type, but their family characteristics are closer to those of the subgroup with behavior problems and academic difficulties. On the family front, this subgroup reports the lowest level of parental control. This parenting practice is associated both with dropout risk (McNeal, 1999) and behavioral disorders (Frick, 1998). Although they come from conflict-ridden families, these students manage to maintain a good academic performance and harmonious relationships with teachers and other students. Loeber et al. (1993) show that these students engage in covert minor misdemeanors (lying or shoplifting), property damage (setting fire, vandalism), and delinquent acts ranging in seriousness from moderate to very serious (joyriding, illegal use of checks or credit cards, stealing cars, selling drugs, breaking and entering). It appears that this subgroup is very much at risk because of the co-occurrence of covert behavior problems, depression and numerous family conflicts. Interaction among several risk factors considerably increases the risk of school dropout.

Scientific documentation pertaining to the characteristics of students at risk of school dropout has focused mainly on the students' externalized behavior problems and learning difficulties (Fortin et al., 2004). For students belonging to the School and Social Adjustment Difficulties type, not only is the risk of dropping out very high, but they are the students most likely to disrupt the classroom and school climate, either by their slow progress or their inappropriate behavior. The results of our study show that there is a subgroup of at-risk students who are characterized by the co-occurrence of behavior problems and learning difficulties. First, we see that these students obtain very low grades in math and French. Second, the teachers describe them as unstable, agitated, stubborn, disobedient, immature and uncooperative. These findings match those of Potvin and Rousseau (1991), who report that in general, the teacher-student relationship is more negative for children with academic and social difficulties than for children without difficulties. These findings are consistent with studies which report that the combination of social and academic difficulties is a very important factor in potential school dropout (Blackorby, Edgard & Kortering, 1991; Vickers, 1994). These studies suggest that teachers' attitudes vary depending on students' academic abilities and behavior. The literature review would lead one to believe that students of the SSAD type form the large majority of students at risk for dropout, and most prevention programs target these students (Fortin et al. 2004). However, our study shows that this subgroup represents about one-third of students with dropout risk. The discussion that follows deals with certain particularly important risk factors revealed by the results of our clustering technique.

Our study highlighted the fact that many at-risk students exhibit internalized behavior problems, mainly problems associated with depression. Although all four subgroups of students show higher depression levels than those of the control group, the Depressive subgroup reaches a very high clinical threshold. These results are scientifically significant, as the relationship

between depression and dropout risk remains unexplored in the literature. In concrete terms, these data reveal the distress of a large subgroup of at-risk students who tend to be ignored by school personnel because they are not disruptive. They do not exhibit externalized behavior problems and their academic performance is good. Compared to students in the other subgroups, teachers' attitudes towards these students are the most positive. The Depressive students may experience sadness or irritability, low self-esteem, social isolation, concentration difficulties, a loss of interest in usual activities, insomnia, constant fatigue, psychomotor agitation and suicidal thoughts. Of all the students at risk for school dropout, this type has the most problematic family situation, in terms of the parents' parenting skills and difficult relationships among family members. In this regard, Marcotte, Giguère, Fortin, Royer and Potvin (1999) found that these students come from conflict-ridden families and their parents are mainly preoccupied with their own distress; thus it could imply that they are not available to discuss their child's plans for the future. These results suggest some research questions for future studies. Is the dropout risk a manifestation of a separate psychological difficulty associated with depression? Does the combination of family and personal difficulties contribute first to the development of depression, and then, to risk of dropout?

Relative importance of school performance

Although recognizing that poor academic performance is a risk factor strongly associated with school dropout, this study demonstrates that at the beginning of high school, many at-risk students do not exhibit any significant problems in this regard. Our results are consistent with other studies, which report very strong links between learning difficulties and behavior problems for one subgroup (Fortin, Toupin, Pauzé, Déry & Mercier, 1996; Hinshaw, 1992; Patterson, Forgatch, Yoerger & Stoolmiller, 1998). It appears, as reported by Patterson et al. (1998), that behavior problems interfere with learning and lead to academic failure. Our results show that

students' average grades decline significantly from one subgroup to another. The control group has the best grades, followed, in descending order, by the Depressive subgroup, the Covert behavior subgroup, the Uninterested in School subgroup and finally, the School and Social Adjustment Difficulties subgroup. However, these results introduce some important nuances: while one-third of at-risk students exhibit learning difficulties, two-thirds of these students show low motivation as a greater risk factor than poor academic performance. Therefore, if only one factor, related to externalized behavior problems or learning difficulties, is considered at the beginning of high school to identify students at risk for dropout, very many at-risk students could remain undetected and thus may not be selected to take part in prevention programs.

Family problems and school dropout risk

We draw attention to our findings regarding the importance of the family context for the phenomenon under study. Students at risk for school dropout perceive many problems within their family. First, they report that they cannot rely on support from their family members. Second, they mention communication problems with their parents. They find it very difficult to initiate discussions with their parents, whether the subject is family chores, current events or television programming. Third, they perceive their parents as not being helpful in planning time to get their homework done. Lastly, discussions about studies or future career plans are also very limited. These results concerning the family profile of at-risk students are consistent with other studies examining this issue. In fact, there is increasing documentation pertaining to the influence of parents on the child's school dropout process. Battin-Pearson et al. (2000) and Rumberger (1995) report that low parental expectations regarding academic achievement is a variable strongly associated with the child's school dropout. Jimerson et al. (2000) find that the quality of the family environment and the quality of parenting dispensed to the child are strong predictors of school achievement or dropout. In general, studies show a significant link between the level of

parental participation in school-sponsored activities and the child's academic adequacy (Battin-Pearson et al. 2000; Finn & Rock, 1997; McNeal, 1999).

The chief limitation of our study lies in the use of self-reported measures assessing students' and teachers' perceptions. We believe that interviews with parents would give access to more precise data, leading to a clearer understanding of the role of family variables in the make-up of each at-risk student type. Future studies should rely on an assessment protocol that is also directed at parents and which consists of self-reported questionnaires, interviews and direct observation of students' classroom behavior.

Conclusion

This study makes a major contribution to the development of knowledge on school dropout. First, the results support the hypothesis that students at risk for dropout form a very heterogeneous population. The identification and validation of the existence of four types of at-risk students in the studied sample confirm this hypothesis and corroborate the findings of other studies conducted on this subject. Second, the typology developed in this study identifies not only the students' characteristics, but also the contexts most strongly associated with dropout risk and school achievement. This original perspective considers the complexity of the dropout phenomenon and allows the identification of certain subgroups of at-risk students not reported in the other studies reviewed. Moreover, taking into account all the contexts involved in school dropout in the clustering technique qualifies the importance of behavior problems and learning difficulties, while emphasizing the significance of the signs of depression and the family climate in the development of dropout risk. These results cast new light on the complexity of dropouts' profiles and underline the equivocal nature of the findings of univariate or bivariate studies on dropout risk and categorization of profiles of at-risk students.

To summarize, in light of a multifactorial conceptualization of school dropout risk, our observations regarding the different subgroups suggest the existence of several possible developmental pathways leading to potential school dropout. This finding underlines the need for more thorough documentation of the specific characteristics of subgroups of students placed at-risk. In terms of concrete benefits, the advancement of knowledge in this field will ensure that prevention programs are better suited to the specific needs manifested by different types of students at risk for school dropout.

Table 1

Scree test of agglomeration coefficients (distance measures)

Number of clusters	Agglomeration coefficients (distance measures)	% increase to next level
8	204693.34	4.8
7	215116.16	6.1
6	229117.00	6.8
5	246003.84	7.5
4	265951.81	7.3
3	286988.13	16.2
2	342635.75	26.6
1	466563.13	----

Table 2

Clustering variables and risk score descriptive statistics: means, F value and post hoc tests

Clustering variables	Clusters of at-risk students				Control Group (C) (n = 493)	F value	Post Hoc Dunnett's Tests
	1 ACB (n = 60)	2 US (n = 126)	3 SSAD (n = 97)	4 DEP (n = 34)			
Teacher's attitudes	32.7	37.3	-4.8	38.5	35.2	268.4*	3<C
Externalizing problems	.90	.98	3.85	.76	0.91	45.10*	3>C
Math grades	74	73	62	79	80	19.56*	1,2,3<C
Family cohesion	40.4	59.9	46.7	15.9	58.9	140.51*	1,3,4<C
Family expression	50.1	54.9	50.1	39.2	54.7	22.90*	1,3,4<C
Family organization	48.2	55.7	50.2	44.5	57.0	18.23*	1,3,4<C
Depression	15.5	9.0	12.4	18.3	5.2	12.48*	1,2,3,4>C
Emotional support	2.6	2.9	2.6	2.2	3.1	11.58*	1,2,3,4>C
Family control	44.2	50.0	50.2	57.2	47.9	12.41*	1<C, 4>C
Delinquency	5.7	4.4	6.8	4.7	3.3	7.50*	1,2,3>C
Classroom's order & organisation	1.4	1.8	1.5	1.4	2.3	2.20	1,2,3,4<C
Risk of dropout score	7.9	6.4	10.1	8.5	2.1	n.a.	1,2,3,4>C

* p < .01

ACB= Antisocial covert behavior; US= Uninterested in School; SSAD= School and social adjustment difficulties; DEP= Depressive.

Table 3

Discriminant analysis: structure coefficients and centroids

Clustering variables	Function 1 $X^2 = 723.3^*$	Function 2 $\chi^2 = 310.9^*$	Function 3 $\chi^2 = 37.92^*$
Teacher's attitudes	.95	-.13	-.03
Externalizing problems	-.39	.08	.18
Math grades	.27	-.15	-.02
Family cohesion	.10	.96	.02
Family expression	.05	.38	-.22
Family organization	.08	.32	.25
Depression	-.03	-.28	-.26
Emotional support	.04	.27	-.00
Family control	-.01	-.10	.89
Delinquency	-.15	-.02	-.23
Classroom's order and organisation	.04	.10	.15
Clusters	Centroids		
1- Antisocial Covert behaviors	0.68	-0.69	-0.70
2- Uninterested in School	1.34	0.98	0.15
3- School and Social Ajustment Difficulties	-2.48	0.19	0.01
4- Depressive	0.91	-2.94	0.49

* $p < .001$

Table 4

Validation variables descriptive statistics for the original clusters: means, F and post hoc tests

Validation variables	Clusters of at-risk students: means				Control group (c) (n = 493)	F	Post hoc Dunnett's Tests
	1 ACB (n = 60)	2 US (n = 126)	3 SSAD (n = 97)	4 DEP (n = 34)			
French grades	72.3	71.0	64.4	74.7	75.9	15.72**	1,2,3<C
Internalizing problems	4.07	3.29	4.33	3.18	2.99	2.90*	1,3>C
Cooperation	16.9	17.4	10.8	17.9	17.3	84.55**	3<C
Encouragement of autonomy	2.58	2.44	2.29	2.27	2.43	2.92*	n.s.
Parental involvement	3.06	3.36	3.07	2.70	3.51	15.74**	1,2,3,4<C
Communication	1.89	2.29	2.16	1.67	2.42	10.12*	1,3,4<C
Family conflicts	49.4	43.5	51.8	62.3	42.5	24.63**	1,3,4>C
Teacher control	2.05	2.43	2.52	2.29	2.01	1.21	2,3>C

* p < .05 ** p < .01

ACB= Antisocial covert behavior; US= Uninterested in School; SSAD= School and social adjustment difficulties; DEP= Depressive.

Table 5

Validation: clustering variables descriptive statistics obtained following nonhierarchical cluster analysis with initial seed points

Validation variables	Clusters				Control group (n = 493)
	1-A ACB (n = 65)	2-A US (n = 122)	3-A SSAD (n = 87)	4-A DEP (n = 43)	
Teacher's attitudes	29.5	38.2	-6.5	34.6	35.2
Externalizing problems	1.3	0.8	4.0	1.0	.91
Math grades	69	76	59	81	80
Family cohesion	42.2	59.9	49.2	16.3	58.9
Family expression	48.0	55.1	52.5	39.7	64.7
Family organization	48.0	55.3	52.4	43.5	57.0
Depression	13.4	9.2	11.8	20.0	5.2
Emotional support	2.5	2.9	2.6	2.2	3.1
Family control	45.6	49.7	49.3	56.9	47.9
Delinquency	5.9	4.3	6.8	5.3	3.3
Classroom's order and organisation	1.4	1.8	1.5	1.3	2.3

ACB= Antisocial covert behavior; US= Uninterested in School; SSAD= School and social adjustment difficulties; DEP= Depressive

Table 6

Validation : clustering variables descriptive statistics obtained following nonhierarchical cluster analysis with random seed points

Clustering variables	Clusters of at-risk students			
	1-B CB (n = 25)	2-B SSAD (n = 76)	3-B DEP (n = 61)	4-B US (n = 155)
Teacher's attitudes	-7.4	-3.1	35.5	37.1
Externalizing problems	4.8	3.6	0.8	0.8
Math grades	67	59	78	74
Family cohesion	24.9	55.8	23.1	56.6
Family expression	44.3	53.9	41.8	54.0
Family organization	41.6	55.1	44.7	53.8
Depression	18.9	9.9	18.2	9.9
Emotional support	2.4	2.7	2.3	2.8
Family control	51.4	49.1	53.9	48.2
Delinquency	8.0	6.7	5.0	4.5
Classroom's order and organisation	1.4	1.4	1.8	1.5

ACB= Antisocial covert behavior; US= Uninterested in School; SSAD= School and social adjustment difficulties; DEP= Depressive.

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